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SHORT COMMUNICATION

Aberrant plumage records in Southern Lapwing *Vanellus chilensis* (Aves: Charadriidae)

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Abstract

Aberrant colored plumages in birds are not uncommon events in nature. These cases might be associated with genetic, environmental and nutritional factors, the presence of parasites, or even age. This study had the objective of reporting two new aberrant plumage cases in *Vanellus chilensis* individuals, an individual with progressive greying and a melanistic one, and review information available at the "Birds of Brazil Encyclopedia" (WikiAves). The study also presents a case review of published cases in indexed journals about *V. chilensis* aberrant coloring published in indexed journals. In total, 24 cases of *V. chilensis* individuals with aberrant plumage are known. For some cases following current specialized literature, we only suggest changes to progressive graying and brown. Finally, we encourage researchers to publish their records of birds with aberrant plumage in scientific journals.

Keywords

brown, Charadriiformes, dilution, Leucism, melanism, progressive greying

The Southern Lapwing *Vanellus chilensis* (Molina, 1782) (Charadriiformes, Charadriidae), is a bird species, occurring from Central America to Tierra del Fuego, found in open pasture environments, near lakes and ponds and in urban areas (Sick 1997; Couve and Vidal 2003), is about 30 cm in total length, and its coloring consists of a black stripe that goes from its neck to its chest, reddish iris and tarsus, and greyish dorsal plumage from head to tail. The ventral plumage is partially white. The presence of a crest at the nape is noted, as well as spurs on the wings, used as a defense mechanism. However, it has no apparent sexual dimorphism (Belton 1994; Sick 1997; Couve and Vidal 2003).

Cases of color aberrations in birds are not considered uncommon events in the wild, but they lack reports on specialized literature (Urcola 2011; Guay et al. 2012; van Grouw 2013; Corrêa et al. 2017; Petry et al. 2017). These coloring anomalies may be associated with genetic, environmental and nutritional factors, the presence of parasites, or even age (Moller and Moussaeu 2001; van Grouw et al. 2011; Guay et al. 2012). The cases of highest incidence mentioned in birds are of individuals presenting albinism, leucism, progressive greying, dilution, brown and melanism (van Grouw 2013, 2017). However, other color aberrations in birds are mentioned in the literature (Nemésio 1999, 2001; van Grouw 2013), such as, for example: cyanism (Nemésio, 2001), ino, schizochroism and grizzle (van Grouw 2006; 2012; 2018).

Albinism is characterized by the loss of all melanin pigments (eumelanin and pheomelanin), carotenoids, if present in the species, are unaffected (van Grouw 2006, 2012, 2013). This is the same for the bare parts (bill and feet), carotenoids remain. The plumage is whitish, red eyes and pink feet and bill (van Grouw 2012, 2013). Leucism can be defined as complete or partial. Complete presents a lack of melanin in all parts of the plumage, due to the hereditary absence of pigment cells from all areas of the skin. In this case, the all-white plumage, pink feet, normally colored eyes (van Grouw 2018). Partial is characterized by a lack of melanins in some parts of the plumage and skin due to the hereditary absence of pigment cells in some areas of the skin. Some feathers stand out completely white. Yellow bill and pink feet or normally colored bill and feet, normally colored eyes (van Grouw 2018).

In aberrant progressive greying, due to lack of melanin, some parts of the plumage turn white and/or feathers randomly mixed with those of normal color. Eyes usually remain normal (*see*, van Grouw 2013, 2018). The dilution is characterized by a quantitative reduction of melanins, consisting of two main categories (*pastel* and *isabel*). In *pastel*, both pigments (eumelanin and phaeomelanin) are affected (van Grouw 2012, 2013). In this aberration category the plumage black and brown becomes silvery grey and reddish/yellowish brown becomes buff/cream. In *isabel*, only eumelanin is affected. In this aberration category black and brown becomes silvery grey while reddish/yellowish brown stays unaffected (van Grouw 2012, 2013).

The brown aberration is defined by the reduction of eumelanin. In affected species plumage, black is brown, originally reddish/yellow-brown unaffected. Sometimes feathers may further depigment to a white hue due to exposure to light, being confused by leucism (van Grouw 2006, 2012, 2013, 2018). Melanism is often described as excess pigmentation (eumelanin and phaeomelanin), which is not neces-

Figure 1. Individuals of Southern Lapwing (*Vanellus chilensis*): (**A**) with progressive greying (photograph by Fernando Barbosa Nunes); (**B, C**) with melanism (photographs by Vinicius Weber).

sarily correct (van Grouw 2017). In case of melanism the coloration of both feathers and skin will depend on the concentrations of these pigments in the feather formations (van Grouw et al. 2011; van Grouw and Nolazco 2012; van Grouw 2017). In some cases, pigmentation levels may not increase sufficiently to make the bird completely black, including some cases leading to lighter colorations than the normal pattern of the species (van Grouw et al. 2011; van Grouw 2017).

Vanellus chilensis individuals with aberrant color have been already described, for example, on: Cestari and Costa (2007), Franz and Fleck (2009), Urcola (2011), Brum et al. (2017), Corrêa et al. (2017), Junqueira et al. (2017) and Bem et al. (2020). Some photographic records are available online at web page WikAves (https://www.wikiaves.com.br). In this sense, the present study aimed to present two new cases of aberrant color in *V. chilensis*. In addition, through a literature review and searching the WikiAves website, the cases of color aberrant in *V. chilensis* were compiled.

The new aberrant color records in *V. chilensis* were based on two opportunistic occasions. On 15 November 2018, a mutant individual with plumage depigmentation was recorded in the urban perimeter (32°06'10.6"S, 52°10'42.3"W) at the city of Rio Grande, state of Rio Grande do Sul, Brazil. The plumage is pied, totally white feathers mixed with normal colored feathers. Apparently, the tarsus had a partial depigmentation. The second case of mutation was recorded on 5 March 2019. An individual of *V. chilensis* with dark plumage was recorded in the urban perimeter in the city of Igrejinha, Rio Grande do Sul, Brazil (29°36'14.3"S, 50°48'13.2"W). Both

Table 1. Recorded cases of aberrant plumage in *Vanellus chilensis* (aberrant plumage reported). Checking on van Grouw (2011, 2012, 2013, 2017, 2018), we suggest a change in the category of plumage that was presented (aberrant plumage suggestion). The public access link of the respective authors cited on Wikiaves can be found in the references.

Aberrant plumage reported	Aberrant plumage suggestion	City	State	Country	Authors
Melanism	–	Igrejinha	Rio Grande do Sul	Brazil	Present study
Progressive greying	–	Rio Grande	Rio Grande do Sul	Brazil	Present study
Albinism	Progressive greying	Novo Hamburgo	Rio Grande do Sul	Brazil	Fenalti (2007)
Partial leucism	Progressive greying	Novo Hamburgo	Rio Grande do Sul	Brazil	Franz and Fleck (2009)
Partial leucism	Progressive greying	Dois Irmãos das Missões	Rio Grande do Sul	Brazil	Fortes (2010)
Leucism	Progressive greying	Tavares	Rio Grande do Sul	Brazil	Krause (2011)
Leucism	Brown	Santo Cristo	Rio Grande do Sul	Brazil	Rockenbach (2014)
Not mentioned	Brown	Aceguá	Rio Grande do Sul	Brazil	Wall (2016)
Partial leucism	Progressive greying	São Leopoldo	Rio Grande do Sul	Brazil	Brum et al. (2017)
Partial leucism	Progressive greying	São Sepé	Rio Grande do Sul	Brazil	Corrêa et al. (2017)
Leucism	Progressive greying	São Marcos	Rio Grande do Sul	Brazil	Bossardi (2018)
Albinism	Progressive greying	São João do Sul	Santa Catarina	Brazil	Cardoso (2010)
Not mentioned	Progressive greying	Sul Brasil	Santa Catarina	Brazil	Bessegatto (2019)
Partial leucism	Progressive greying	Curitiba	Paraná	Brazil	Franz and Fleck (2009)
Leucism	Progressive greying	Querência do Norte	Paraná	Brazil	Oliveira (2013)
Albinism	Progressive greying	Campo Largo	Paraná	Brazil	Genari (2014)
Brown	–	Miranda	Mato Grosso do Sul	Brazil	Bem et al. (2020)
Not mentioned	Progressive greying	Ilhéus	Bahia	Brazil	Sena (2016)
Leucism	Progressive greying	São Pedro da Aldeia	Rio de Janeiro	Brazil	Paixão (2017)
Not mentioned	Progressive greying	Brasília	Distrito Federal	Brazil	Carrano (2018)
Partial leucism	Progressive greying	Barro Alto	Goiás	Brazil	Junqueira et al. (2017)
Partial leucism	Progressive greying	–	Río Negro – El Bolsón	Argentina	Urcola (2011)
Dilution-*pastel*	Brown	–	Misiones – Posadas	Argentina	Urcola (2011)
Dilution-*pastel*	Brown	–	Buenos Aires	Argentina	Urcola (2011)

cases described are of adult individuals of undetermined sex and at the time of observation were near another individual with normal plumage. Both individuals were checked according to descriptions by van Grouw (2012, 2013, 2014, 2017, 2018) for definition of the aberrant coloring presented.

In addition, from January to October 2019 we conducted a review in online indexed journals (in scientific notes and/or articles) reporting cases of aberrant color in *V. chilensis* and photographic records that are available on the WikAves web page (https://www.wikiaves.com.br). According to WikiAves suggestion, we contacted some authors to use their photos images to illustrate the manuscript. WikiAves holds an extensive collection of wild birds' photos, published by amateur and professional photographers both, and is currently widely used and mentioned in scientific research in Brazilian ornithology. Compiled records were verified by checking descriptions of aberrant color in birds as described by van Grouw (2012, 2013, 2014, 2017, 2018). In some cases of aberrant color, we suggest changes in the category that has been described.

The two new records of aberrant plumage in *V. chilensis* are an individual with progressive greying and an individual with melanism, both in the state of Rio Grande do Sul, Brazil (Fig. 1). Through the review in scientific publications, eight records of aberrant color in *V. chilensis* were reported. On WikAves, all available images were

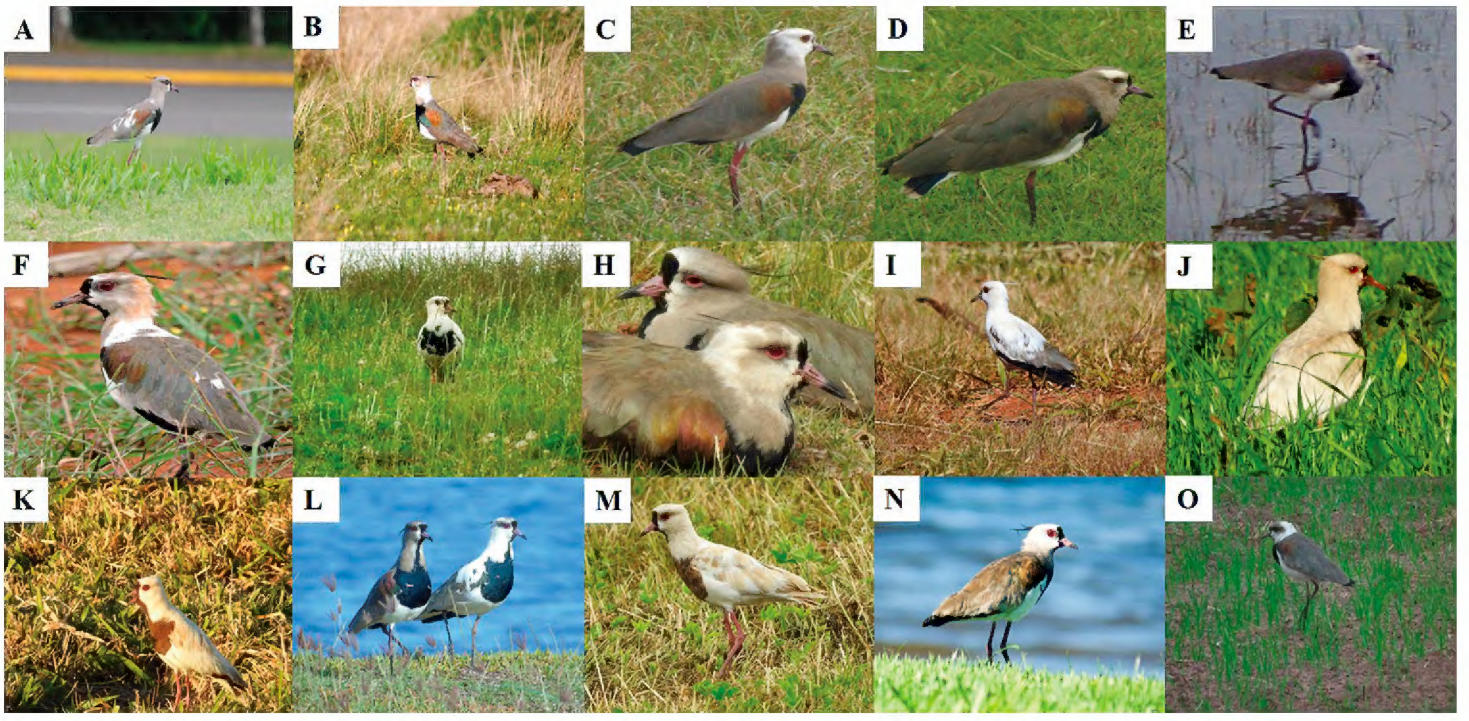

Figure 2. Some cases of aberrant plumage in *Vanellus chilensis* being used to depict the respective patterns of mutations for the species, available in indexed periodics and/or public access at Wikiaves [WA]: (**A**) progressive greying* (partial leucism according to Brum et al. 2017); (**B**) progressive greying* (partial leucism according to Corrêa et al. 2017); (**C**, **D**) progressive greying* (partial leucism according to Franz and Fleck 2009); (**E**) progressive greying* (partial leucism according to Cestari and Costa 2007); (**F**) progressive greying* (partial leucism according to Junqueira et al. (2017); (**G**) progressive greying* (partial leucism according to Fortes 2010). Photo: Márcio Martins Fortes, [WA224682]; (**H**) progressive greying* (partial leucism according to Bossardi 2018). Photo: Claudio Cesar, [WA2853973]; (**I**) progressive greying* (not mentioned the aberrant coloring by Carrano 2018). Photo: Guilherme Carrano [WA3014175]; (**K**) brown (Bem et al. 2020); (**L**) progressive greying* (partial leucism according to Paixão 2017). Photo: Juliana Paixão, [WA2615962]; (**M**) brown* (not mentioned the aberrant coloring by Wall 2016). Photo: Adolf Wall, [WA2381127]; (**N**) progressive greying*(not mentioned the aberrant coloring by Sena 2016). Photo: Ícaro Sena [WA2489837]. (**O**) progressive greying* (leucism by according to Oliveira 2013). Photo: Renan Oliveira, [WA962252]. By checking some cases, we suggest alterations on the aberrant coloring reported (*). The access link of the respective images and authors cited from Wikiaves can be found in the references.

checked, and 13 cases of individuals with aberrant color were found. Some cases available on WikAves were mentioned as individuals with aberrant color by the authors of the images and/or collaborators on the site. The records found in scientific publications and in WikiAves, were reported in individuals with albinism, leucism and dilution. Considering these two new cases of aberrations in *V. chilensis*, as well as records compiled, we check each image and/or report and suggest aberrant color changes in some cases, following van Grouw (2012, 2013, 2014, 2017, 2018). Thus, we found a total of 24 cases of aberrant colored plumage in Southern Lapwing, which, in our understanding, are individuals presenting progressive greying, melanistic and brown (Table 1, Fig. 2).

There are probably other cases of colored plumage in *V. chilensis* in the wild, and possibly of specimens in collections presenting some chromatic anomaly in its plumage. However, many cases of birds with aberrant plumage may have gone un-

noticed during fieldwork and some may have been recorded by ornithologists and/or photographers and to some extent not considered relevant by an indexed journal publication, thus omitting important information that could be disclosed in specialized literature (van Grouw 2013; Petry et al. 2017). In these cases, it's important to monitor these individuals, collecting investigative information that may explain potential patterns of occurrence, possible causes and effects and whether individuals remain in the same region of the record in short and long term (Corrêa et al. 2013b; Corrêa et al. 2013a; Petry et al. 2017; Finger et al. 2018). Some individuals with aberrant plumage may form pairings (Corrêa et al. 2013b; Corrêa et al. 2013a) and present reproductive success (Finger et al. 2018).

Finally, we present two new cases of aberrant plumage for *V. chilensis* and bring together all the records that we find available in articles and online database, of individuals with aberrant plumage. However, for some cases we only suggest changes in the description through the cases we checked, following current specialized literature, as a basis. In this sense, we encourage Brazilian researchers to divulge in indexed journals cases of birds with aberrant color registered in the wild (of a single individual and/or gathering all the cases reported for a species) and of great importance to check the existence of specimens in collections. These disclosures will be the basis for the elaboration of lists of species with aberrant plumage, both at the regional, national and global levels, which could be developed in studies at the end of the course at universities, for example. Another alternative for disclosing these cases would be to compile information among researchers to gather and disseminate such information.

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